



NOTICE OF ALLOWANCE AND FEE(S) DUE

24504 7590 03/11/2009

THOMAS, KAYDEN, HORSTEMEYER & RISLEY, LLP
600 GALLERIA PARKWAY, S.E.
STE 1500
ATLANTA, GA 30339-5994

EXAMINER: AKHAVANNIK, HADI
ART UNIT: 2624 PAPER NUMBER:
DATE MAILED: 03/11/2009

Table with 5 columns: APPLICATION NO., FILING DATE, FIRST NAMED INVENTOR, ATTORNEY DOCKET NO., CONFIRMATION NO.

10/714,634 11/18/2003 Hui-Huang Chang 251812-1030 3258

TITLE OF INVENTION: APPARATUS FOR REDUCING ZIPPER OF IMAGE AND METHOD THEREOF

Table with 7 columns: APPLN. TYPE, SMALL ENTITY, ISSUE FEE DUE, PUBLICATION FEE DUE, PREV. PAID ISSUE FEE, TOTAL FEE(S) DUE, DATE DUE

nonprovisional NO \$1510 \$300 \$0 \$1810 06/11/2009

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

**Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
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 P.O. Box 1450
 Alexandria, Virginia 22313-1450
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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

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Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/714,634 11/18/2003 Hui-Huang Chang 251812-1030 3258

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nonprovisional NO \$1510 \$300 \$0 \$1810 06/11/2009

EXAMINER	ART UNIT	CLASS-SUBCLASS
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AKHAVANNIK, HADI 2624 382-275000

<p>1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).</p> <p><input type="checkbox"/> Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.</p> <p><input type="checkbox"/> "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required.</p>	<p>2. For printing on the patent front page, list</p> <p>(1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____</p> <p>(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____</p> <p>3 _____</p>
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3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY AND STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : Individual Corporation or other private group entity Government

<p>4a. The following fee(s) are submitted:</p> <p><input type="checkbox"/> Issue Fee</p> <p><input type="checkbox"/> Publication Fee (No small entity discount permitted)</p> <p><input type="checkbox"/> Advance Order - # of Copies _____</p>	<p>4b. Payment of Fee(s); (Please first reapply any previously paid issue fee shown above)</p> <p><input type="checkbox"/> A check is enclosed.</p> <p><input type="checkbox"/> Payment by credit card. Form PTO-2038 is attached.</p> <p><input type="checkbox"/> The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).</p>
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5. Change in Entity Status (from status indicated above)

a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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EXAMINER

AKHAVANNIK, HADI

ART UNIT PAPER NUMBER

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Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)

(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 857 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 857 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Notice of Allowability

Application No. 10/714,634	Applicant(s) CHANG ET AL.	
Examiner HADI AKHAVANNIK	Art Unit 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

- 1. This communication is responsive to 3/10/09.
- 2. The allowed claim(s) is/are 1-6,8-11 and 13-19.
- 3. Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some* c) None of the:
 - 1. Certified copies of the priority documents have been received.
 - 2. Certified copies of the priority documents have been received in Application No. _____.
 - 3. Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

- 4. A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 - 5. CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) hereto or 2) to Paper No./Mail Date _____.
 - (b) including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**
- 6. DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- 1. Notice of References Cited (PTO-892)
- 2. Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3. Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
- 4. Examiner's Comment Regarding Requirement for Deposit of Biological Material
- 5. Notice of Informal Patent Application
- 6. Interview Summary (PTO-413), Paper No./Mail Date _____.
- 7. Examiner's Amendment/Comment
- 8. Examiner's Statement of Reasons for Allowance
- 9. Other _____.

/Jingge Wu/
Supervisory Patent Examiner, Art Unit 2624

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Dan McClure (38962) on 3/10/09.

The application has been amended as follows:

1. (Currently amended) A method for building a recovery model, the recovery model being used to reduce a zipper of image data, said method comprising:

producing a plurality of outputted signals from image sensors according to a plurality of brightness, wherein the brightness are not all the same;

measuring a plurality of differences according to the outputted signals and a plurality of estimated signals corresponding to the brightness, wherein the plurality of estimated signals vary in magnitude in relation to the brightness intensity;

establishing an interference model according to the differences, wherein the interference model is a mathematical model that describes an effect of distortion on a real signal caused by a mixing of outputs from a first image sensor and a second image sensor;

producing the recovery model according to the interference model, such that the recovery model is a mathematical inverse of the interference model; and

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applying the recovery model to the a distorted signal to generate a recovered signal, wherein the recovered signal has reduced zipper of the image data.

2. (Original) The method of claim 1, wherein the step of producing the recovery model through a mathematic method according to the interference model.

3. (Previously presented) The method of claim 2, wherein the mathematic method is Neural Network or Fuzzy Control or Matrix model or Nearly Decoupled Model.

4. (Original) The method of claim 3, wherein the Neural Network method comprises:

setting a tolerance value;

inputting a plurality of input data into an initial model;

producing an output data from the initial model;

modifying the initial model according to a difference of the output data and the input data; and

outputting the modified model as the recovered model.

5. (Currently amended) A method for improving a quality of digital image data through a recovery model, the method comprising:

receiving a pixel data of the digital image data;

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calculating the pixel data by the recovery model according to a difference of the pixel data and at least one adjacent pixel data, wherein the recovery model is a mathematical inverse of a model that describes an effect of distortion on a real signal caused by a mixing of outputs from an odd image sensor of a CCD (charge coupled device) and an even sensor of the CCD; and

~~producing a recovered image data from a plurality of calculated pixel data, wherein the quality of the recovered image data is better than that of the digital image data.~~

producing a plurality of outputted signals according to a plurality of brightness, wherein the brightness are not all the same;

measuring a plurality of differences according to the outputted signals and a plurality of estimated signals corresponding to the brightness, wherein the plurality of estimated signals vary in magnitude in relation to the brightness intensity;

establishing an interference model according to the differences, wherein the interference model is a mathematical model that describes an effect of distortion on a real signal caused by a mixing of outputs from a first image sensor and a second image sensor;

producing the recovery model according to the interference model; and

using the recovery model to reduce the zipper of image data.

6. (Original) The method of claim 5, wherein the zipper of the recovered image data is not as serious as that of the digital image data.

7. (Cancelled)

8. (Currently amended) The method of claim ~~[[7]]~~ 5, wherein the step of producing the recovery model through a mathematic method according to the interference model.

9. (Previously presented) The method of claim 8, wherein the mathematic method is Neural Network or Fuzzy Control or Matrix model or Nearly Decoupled Model.

10. (Original) The method of claim 9, wherein the Neural Network comprising: setting a tolerance value; inputting a plurality of input data into an initial model; producing an output data from the initial model; modifying the initial model according to a difference of the output data and the input data; and outputting the modified model as the recovered model.

11. (Currently amended) An apparatus for reducing a zipper of image data, comprising:

a recovery module for storing a plurality of recovery parameters, the recovery parameters are corresponding to the zipper, wherein the recovery model is a mathematical inverse of a model that describes an effect of distortion on a real signal

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caused by a mixing of outputs from a first image sensor and a second image sensor;
and

a processing logic, coupled to the recovery module, for receiving a digital image data, and calculating the digital image data with the recovery parameters to produce a recovered image data; wherein the processing logic further includes , ~~wherein the zipper of the recovered image data is not as serious as that of the digital image data.~~

logic for producing a plurality of outputted signals according to a plurality of brightness, wherein the brightness are not all the same;

logic for measuring a plurality of differences according to the outputted signals and a plurality of estimated signals corresponding to the brightness, wherein the plurality of estimated signals vary in magnitude in relation to the brightness intensity;

logic for establishing an interference model according to the differences, wherein the interference model is a mathematical model that describes an effect of distortion on a real signal caused by a mixing of outputs from a first image sensor and a second image sensor;

logic for producing the recovery model according to the interference model; and

logic for using the recovery model to reduce the zipper of image data.

12. (Cancelled)

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13. (Currently amended) The method of claim ~~[[12]]~~ 11, wherein the step of producing the recovery model through a mathematic method according to the interference model.

14. (Previously presented) The apparatus of claim 13, wherein the mathematic method is Neural Network or Fuzzy Control or Matrix model or Nearly Decoupled Model.

15. (Original) The apparatus of claim 11, wherein the processing logic is configured to perform the following functions:

receive a pixel data of an image data;

calculate the pixel data by the recovered model according to a difference of the pixel data and at least one adjacent pixel data; and

produce the recovered image data from the calculated pixel data.

16. (Original) The apparatus of claim 15, wherein the processing logic is a hardware or software or firmware.

17. (Previously presented) The method of claim 1, wherein the step of producing a plurality of outputted signals more specifically comprises producing a plurality of measured voltages, each of the measured voltages corresponding to an input brightness, and wherein the step of measuring a plurality of differences according to the

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outputted signals more specifically comprises measuring a voltage difference between the measured voltages and a theoretical voltage corresponding to the input brightness.

18. (Previously presented) The method of claim 7, wherein the step of producing a plurality of outputted signals more specifically comprises producing a plurality of measured voltages, each of the measured voltages corresponding to an input brightness, and wherein the step of measuring a plurality of differences according to the outputted signals more specifically comprises measuring a voltage difference between the measured voltages and a theoretical voltage corresponding to the input brightness.

19. (Previously presented) The method of claim 1, wherein the first and second image sensors are an odd image sensor of a CCD (charge coupled device) and an even image sensor of the CCD.

REASONS FOR ALLOWANCE

The following is an examiner's statement of reasons for allowance:

The independent claims recite a method of reducing zipper in an image by modeling the error based on brightness, establishing a model, producing a recovery model based on the first model, and removing the zipper based on the recovery model.

The above features, as explicitly recited, and in combination with the other elements of the claim are neither disclosed nor suggested by the nearest prior art of the record.

Prior arts Fiete, Bolin, Nakata et al. (6747696), and Takahashi (6744916) do not disclose these steps.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HADI AKHAVANNIK whose telephone number is (571)272-8622. The examiner can normally be reached on 10:30-7:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu can be reached on 571-272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jingge Wu/

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Supervisory Patent Examiner, Art Unit 2624

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3/10/09